

NITSBERG, L.V.; YAKUBOVICH, S.V.; KOLOTYRKIN, Ya.M.

Electrochemical investigations of the protective properties of
lacquer paint materials and coatings on steel in an electrolyte
medium. Lakokras.mat. i ikh prim. no. 17-23 '60. (MIRA 14:4)
(Protective coatings)

YAKUBOVICH, S.V.; RIVLINA, Yu.L.; MASLENNIKOVA, N.L.

Aging of paint and lacquer coatings (brief survey of the literature).
Lakokras.mat. 1 ikh prim. no.1:88-95 '80. (MIRA 14:4)
(Paint materials) (Protective coatings)

YAKUBOVICH, S.V.; RIVLINA, Yu.L.; MASLENNIKOVA, N.L.

Study of the mechanical properties and stability of protective
coatings in the process of aging. Lakokras.mat.i ikh prim. no.3:
19-22 '60. (MIRA 14:4)

(Protective coatings---Testing)

RUBINSHTEYN, B.L.; YAKUBOVICH, S.V.; BOGDANOVA, G.S.; BAZILEVICH, Z.A.

Photometric method for determining the whitening capacity (intensity)
of white pigments. Lakokras.mat.1 ikh prim. no.3:51-55 '60.

(MIRA 14:4)

(Pigments)

YAKUBOVICH, S.V.; KARYAKINA, M.I.

Study of protective coatings based on the cresol-formaldehyde resin
and polyvinyl butyral. Lakokras.mat. iikh prim. no.4:20-26 '60.

(MIRA 13:10)

(Protective coatings) (Resins, Synthetic) (Vinyl compounds)

BLOSHTEYN, I.I.; YAKUBOVICH, S.V.

Methods for wear tests of lacquer coatings on furniture.

Lakokras. mat. i ikh prim. no. 6:57-60 '60. (MIRA 13:12)

1. Moskovskiy institut narodnogo khozyaystva im. G.V.Plekhanova.
(Wood--Finishing) (Lacquer and lacquering--Testing)

S/081/61/000/021/088/094
B107/B147

AUTHORS: Nitsberg, L. V., Yakubovich, S. V., Kolotyrkin, Ya. M.

TITLE: Determination of the optimum content of passivating pigments in dyes, and of the effective thickness of protective coatings by electrochemical methods

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 21, 1961, 460 abstract 21P144 (Lakokrasochn. materialy i ikh primeneniye, no. 1, 1961, 13-18)

TEXT: The authors searched for faster test methods to shorten the time required for elaborating formulas for such dyes. They studied the suitability of electrochemical methods for determining the optimum content of passivating pigment in the dye and the effective thickness of protective layers. The following methods were applied: determination of the electric resistance of the coating, and determination of the potential of the varnished metal. These methods proved to be fully applicable. The authors investigated model dyes on drying oil with a mixture of potassium chromate - barium chromate, zinc yellow, zinc oxide, red lead and iron
Card 1/2

Determination of the optimum content ... S/081/61/000/021/088/094
B107/B147

minimum. A 20% volume concentration of the passivating pigment was found to be the optimum. For an efficient protective action of the coatings, the thickness of the film should be greater than the critical thickness, i. e., greater than the thickness at which the electric resistance in the pores of the coating approaches the resistance of the coating itself. If the resistance of the coating exceeds the critical value, the values of the electric potential will be characteristic of the passive state of the metal. The potential will be the greater, the higher the solubility and the passivating capacity of the pigment. If the resistance of the coat is below the critical value, the potential of the steel will gradually lose its noble character. The varnish coating plays the role of a diffusion barrier retarding the access of electrolyte ions to the metal surface and inhibiting the corrosion processes. 7 references. [Abstracter's note: Complete translation.] ✓

Card 2/2

RUBINSHTEYN, B.L.; YAKUBOVICH, S.V.; Prinimali uchastiye: BOGDANOVA, G.S.;
BAZILEVICH, Z.A.

Photometric determination of the dyeing power of ultramarine.
Lakokres.mat. 1 ikh prim. no.2:70-71 '61. (MIRA 14:4)
(Ultramarine)

ROZENFEL'D, I.L.; RUBINSHTEYN, F.I.; YAKUBOVICH, S.V.; KURSKAYA, A.G.

Electrochemical methods for the determination of the passivation
properties of pigments in lacquer-paint coatings. Lakokras.mat.
1 ikh prim. no.3:50-55 '61. (MIRA 14:6)

(Pigments)
(Corrosion and anticorrosives)
(Protective coatings)

KARYAKINA, M.I.; YAKUBOVICH, S.V.

Camera for testing the resistance of paint coatings to the
action of sulfur dioxide. Lakokras. mat. 1 ikh prim.no.3:58
'61. (MIRA 14:6)

(Protective coatings--Testing)
(Sulfur dioxide)

KARYAKINA, M.I.; YAKUBOVICH, S.V.

Investigation of alkyd enamel coatings under the conditions
of increased humidity and temperature. Lakokras, mat. i ikh.
prim. no.4:35-38 '61. (MIRA 16:7)

(Protective coatings)
(Enamel and enameling)

S/081/62/000/016/037/043
B171/B186

AUTHORS: Yakubovich, S. V., Maslennikova, N. L.

TITLE: Investigation of the internal stresses arising in coats of paint during the process of aging

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1962, 549, abstract 16P281 (Lakokrashochn. materialy i ikh primeneniye, no. 5, 1961, 27 - 30)

TEXT: It has been established that an optical method can be used for determining the changes in stress values that arise in coats of paint during the process of aging. The films of these systems investigated which are based on alkyd and alkyd-melamine resins, as well as of those based on nitrocellulose (composition used for motor car finishing enamels with addition of convenient plasticizers) are distinguished by their low internal stress values. It has been shown that in the formation of paint coating films the internal stresses depend on the temperature of formation and on the length of exposure to its action. The higher the curing temperature and the longer it is maintained, the higher are the internal stresses. ✓

Card 1/2

Investigation of the internal...

S/081/62/000/016/037/043
B171/B186

The greatest changes in the film properties, particularly the changes in the internal stress values, occur at the initial stage of the aging process. Subsequently, the internal stresses remain unchanged or show some decrease, owing to relaxation. Under normal working conditions, the paint coatings are subject to only comparatively low internal stresses. [Abstracter's note: Complete translation]

Card 2/2

RIVLINA, Yu.L.; MALINSKIY, Yu.M.; YAKUBOVICH, S.V.; Prinimali uchastiye:
LARINA, A.N.; YEVINZON, I.I.

Investigating the processes of aging of lacquer and paint
coatings. Report No.1. Investigation of the aging process
of alkyd and alkyd-melamine coatings. Lakokras. mat. i ikh
prim. no.6:31-35 '61. (MIRA 16:3)

(Protective coatings)

UVAROV, A.V.; YAKUBOVICH, S.V.

Investigation of the effect of light on the aging of cellulose
nitrate by infrared spectroscopy. Lakokras. mat. 1 ikh prim.
no.6:49-52 '61. (MIRA 15:3)
(Nitrocellulose) (Spectrum, Infrared)

YAKUBOVICH, S.V.; ZUBCHUK, V.A.; KURBATOVA, O.G.; Prinimali uchastiye:
PERESVETOVA, M.P.; MOSINA, L.V.

Dependence of the properties of coatings based on pentaphtalic
binders on the volume concentration of pigments. Lakokras.-
mat.1 ikh prim. no.1:12-16 '62. (MIRA 15:4)
(Films (Chemistry)) (Pigments)

S/081/62/000/016/038/043
B171/B186

AUTHORS: Karyakina, M. I., Yakubovich, S. V.

TITLE: Investigation on the use of butyl methacrylate and epoxy enamel coatings under conditions of higher humidity and temperature

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1962, 549, abstract 16P282 (Lakokrasochn. materialy i ikh primeneniye, no. 1, 1962, 49 - 52).

TEXT: It has been established that the AC-72 (AS-72) butyl methacrylate enamels show a better resistance to discoloration than other enamels, though they can be used under humid tropical conditions only in combination with the ЭП-09Т (EP-09T) epoxy priming. Under the same conditions the AS-72 enamels made from dry milled paste are superior to those prepared in the usual way. The authors indicate that under conditions of higher temperature and humidity it is also possible to use the ЭП-51 (EP-51) alkyd epoxy nitrocellulose enamel applied on the Э-4021 (E-4021) epoxy primer as well as the gray and light blue ЭП-74Т (EP-74T) epoxy enamels. [Abstracter's note: Complete translation]
Card 1/1

ROZENFEL'D, I.L.; RUBINSHTEYN, F.I.; YAKUBOVICH, S.V.

Method of determining the penetrability of paint coatings to
Cl-ions. Lakokras.mat.1 ikh prim. no.2:58-59 '62. (MIRA 15:5)
(Protective coatings--Testing)

S/081/62/000/023/053/120
B124/B101

AUTHORS: Rozenfel'd, I. L., Rubinshteyn, F. I., Yakubovich, S. V.,
Persiantseva, V. P.

TITLE: Study of guanidine chromate as a corrosion inhibitor in
oil paints

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 23, 1962, 411; abstract
231334 (Lakokrasochn. materialy i ikh primeneniye, no. 3,
1962, 15-21)

TEXT: A new way to increase the protective qualities of pigmented coatings
by means of modifying inert fillers and film-forming materials with
corrosion inhibitors (CI) is suggested. The effect of organic CI on the
properties of the oil paints was examined. It has been shown that
guanidine chromate (GC) has strong passivating properties and that its
effect on the oil coating is to inhibit metal ionization by anodic reaction.
Conditions for obtaining corrosion-resisting oil paints are determined,
with GC used as the CI. [Abstracter's note: Complete translation.]

Card 1/1

RIVLINA, Yu.L.; SURIKOV, I.V.; YAKUBOVICH, S.V.

Methods of determining the elongation strength of paint coatings
in folding. Lakokras.mat.i ikh prim. no.3:69-71 '62. (MIRA 15:7)
(Paint materials--Testing)

S/276/63/000/002/026/052
A052/A126

AUTHORS: Yakubovich, S.V., and Maslennikova, N.L.
TITLE: Investigation of adhesion of paint coatings under conditions of ageing
PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 2, 1963, 103, abstract 2B548 (Lakokrasochn. materialy i ikh primeneniye, no. 4, 1962, 20-25)

TEXT: The results of investigations of adhesion of paint coatings after their formation and in the process of ageing are discussed as well as the interconnections between the adhesion and internal stresses in paint films. Alkyd and alkyd-melamine resin-based paint materials, FK-42v (FK-42v) alkyd resin-based varnish, K-421-02 (K-421-02) butanolized melamine-formaldehyde resin-based varnish and varnish no. 136 were tested. It is shown that FK-42v alkyd resin-based coatings have a higher adhesion to the base than alkyd-melamine resin-based coatings; the change of adhesion of coatings with the increase of temperature and solidification time is explained by the increase of the number of cross bridges in polymeric film generatrices which leads to an increase of internal stresses in the coating.

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S/276/63/000/002/026/052
A052/A126

Investigation of adhesion...

In the process of thermo-oxidizing and photochemical ageing of coatings their adhesion decreases at first owing to the increase of internal stresses, and afterwards changes inconsiderably since internal stresses decrease a little due to relaxation. It is assumed that alkyd and alkyd-melamine resin-based coatings are applied at adhesion values lower than the initial ones, but higher than the internal stress values. Good service properties of alkyd-melamine coatings (in spite of a low plasticity) are explained by the fact that they have a sufficient adhesion and medium internal stresses. The method of a gradual scaling of the base (foil) from the coating can be used for a comparative qualitative characteristic of adhesion of paint coatings.

(Abstracter's note: Complete translation.)

Card 2/2

S/276/63/000/002/031/052
A052/A126

AUTHORS: Amfiteatrova, T.A., Yermolayeva, T.A., Abramson, D.L., and Yakubovich, S.V.

TITLE: Effect of titanium dioxide modification on rheological properties of "tixotropic" (tiksotropnykh) enamels

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no.2, 1963, 110, abstract 2B602 (Lakokrashochn. materialy i ikh primeneniye, no. 4, 1962, 30-32)

TEXT: The results of investigations of rheological properties of "tixotropic" enamels produced by using modified titanium dioxide samples are reported. It is shown that, if titanium dioxide is treated with inorganic aluminum, phosphorus and silicon compounds, the strength of the enamel structure increases as compared with the enamel containing untreated pigments; surface active substances (alkamone OC-2(OS-2)) at 0.1, 0.5 and 1% by weight destroy the structure of enamel and reduce considerably its strength; if titanium dioxide is treated successively with aluminum phosphate and alkamone OS-2, the strength of the structure of enamel decreases

Card 1/2

Effect of titanium dioxide...

S/276/63/000/002/031/052
A052/A126

In the same way as if treated with alkamone alone; titanium dioxide samples of anatase and rutile modification treated with aluminum phosphate, aluminum hydroxide and silicic acid can be recommended for the production of "tixotropic" enamels; titanium dioxide modified by alkamone OS-2 cannot be used for the production of said enamels.

(abstracter's note: Complete translation.)

Card 2/2

KARYAKINA, M.I.; YAKUBOVICH, S.V.; BLAGONRAVOVA, A.A.; Prinimali
uchastiye: LARINA, A.N.; PISKAREVA, K.A.; PERTSOVA, Ye.N.

New type of coatings based on phenol-alkyd resins. Lakokras.
mat.1 ikh prim. no.5:25-27 '62. (MIRA 16:1)
(Phenol condensation products) (Protective coatings)

SANZHAROVSKIY, A.T.; MASLENNIKOVA, N.L.; YAKUBOVICH, S.V.

Using the optical and console methods for investigating the
inner stresses of polymer coatings. Lakokras.mat.1 ikh prim.
no.5:30-37 '62. (MIRA 16:1)

(Polymers) (Strains and stresses)
(Protective coatings—Testing)

ROZENFEL'D, I.L.; RUBINSHTEYN, F.I.; YAKUBOVICH, S.V.; SHERMAN, R.S.;
UVAROV, A.V.

Studying the protective effect of oil paints modified with
chromic acid guanidine. Lakokras.mat.iikh prim. no.6:11-15
'62. (MIRA 16:1)

(Protective coatings) (Guanidine)

GUREVICH, T.N.; ZUBCHUK, V.A.; YAKUBOVICH, S.V.

Photochemical activity of pigments and methods for its
determination. *Lakokras.mat.i ikh priu. no.1:55-57*

'63.

(MIRA 16:2)

(Pigments)

(Photochemistry)

MASLENNIKOVA, N.L.; YAKUBOVICH, S.V.; SANZHAROVSKIY, A.T.; RIVLINA, Yu.L.;
Prinimali uchastiye: EMENKULOV, Yu.M.; KRUCHININA, G.I.;
ZAYTSEVA, L.V.

Internal stresses developed in the process of formation
and aging of nitrocellulose coatings. - Lakokras.mat. i ikh prim.
no.1:15-18 '63. (MIRA 16:2)

(Paint materials)
(Strains and stresses)

CHUPEYEV, M.A.; YAKUBOVICH, S.V.; TSYURUPA, N.N.

Centrifugal method for the dispersion analysis of pigments and paint systems. Lakokras. mat. i ikh prim. no. 4:47-50 '63.

(MIRA 16:10)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut lakokrasochnoy promyshlennosti i Moskovskiy Ordena Lenina Khimiko-tekhnologicheskoy institut im. D.I. Mendeleeva.

YAKUBOVICH, S.V.; UVAROV, A.V.; RUDNAYA, G.V.; ZUBCHUK, V.A.

Studying the photochemical destruction of the films of alkyd
and alkyd-melamine resins with the method of infrared spect-
roscopy. Lakokras. mat. i ikh prim. no.5:21-23 '63.

(MIRA 16:11)

KONOVALOV, Petr Gordeyevich; ZHEBROVSKIY, Vatslav Vatslavovich;
SHNEYDEROVA, Vera Vladimirovna; SOROKIN, M.F., retsenzent;
LYALYUSHKO, K.A., retsenzent; YAKUBOVICH, S.V., retsenzent;
ROGOVIN, Z.A., retsenzent; SOKOLOVA, N.A., red.

[Laboratory work on the chemistry of film-forming substances
and on the technology of coatings and paints] Laboratornyi
praktikum po khimii plenkoobrazuiushchikh i po tekhnologii
lakov i krasok. IAroslavl', Rosvuzizdat, 1963. 202 p.
(MIRA 17:5)

YAKUBOVICH, S. V.

"K voprosu o plastifikatsii khlorirovannogo polivinilkhlorida."

report submitted for 35th Intl Cong, Industrial Chemistry, Warsaw, 15-19
Sep 64.

YAKUBOVICH, S.V.; MASLENNIKOVA, N.L.; SANZHAROVSKIY, A.T.; Prinimali
uchastiye: KRUCHININA, G.I.; DONDE, L.V.; KARYAKINA, L.A.

Studying the internal stresses and mechanical properties of
paints based on cellulose nitrates during their atmospheric aging.
Lakokras.mat. i ikh prim. no.2:37-40 '64. (MIRA 17:4)

RUBINSHTEYN, B.L.; YAKUBOVICH, S.V.; BAZILEVICH, Z.I.

Method for determining the resistance to abrasion of paints.

Lakokras.mat. 1 kh.prim. no.2:50-52 '64. (MIRA 17:4)

L 41057-65 EWP(j)/ENT(m) Pc-4 RM

ACCESSION NR: AP5007142

8/0303/15/000/001/0030/0032

AUTHOR: Zubchuk, V.A.; Yakubovich, S.V.

TITLE: Plastification of coatings based on chlorinated polyvinylchloride

SOURCE: Lakokrasochnyye materialy i ikh primeneniye, no. 1, 1965, 30-32

TOPIC TAGS: polyvinylchloride film, chlorinated polyvinylchloride, polymer film, polymer plastification, plasticizer, film strength, chlorinated diphenyl, tricresyl phosphate, dibutyl phthalate, film adhesion

ABSTRACT: The authors studied the effect of chlorinated diphenyl (Sovoll), tricresyl phosphate, and dibutyl phthalate, plasticizers, widely used in the lacquer industry, on the tensile strength, ultimate relative elongation and adhesive strength of 70-75 μ films prepared from a 15% solution of chlorinated polyvinylchloride in a mixture of acetone, butyl acetate and toluene, with additions of up to 100 wt% of the plasticizers. Additions of dibutyl phthalate were found to increase film adhesion to metal and additions of tricresyl phosphate increased adhesion of grounded coatings. All three plasticizers exhibited a qualitatively identical plasticizing effect, decreasing the tensile strength and increasing the ultimate elongation, dibutyl phthalate being the most effective. Orig. art. has: 5 figures.

Card 1/2

L 41057-65

ACCESSION NR: AP5007142

ASSOCIATION: GPI-4

SUBMITTED: 00

ENCL: 00

SUB CODE: MT, OC

NO REF SOV: 014

OTHER: 001

cc
Card 2/2

L 51398-65 ENT(m)/EPF(c)/ENP(v)/EPR/ENP(j)/T PC-4/Pr-4/PS-4 WH/RM
ACCESSION NR: AP5011257

AUTHORS: Gribkova, N. Ya.; Kozlov, P. V.; Takubovich, S. V.

TITLE: Adhesion and the physicochemical properties of chlorinated polyvinyl-chloride in interbundle plasticization

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 4, 1965, 751-755

TOPIC TAGS: polyvinylchloride, adhesion, mechanical property, organic synthesis

ABSTRACT: Because interbundle and intrabundle types of plasticization affect the glass point differently, and because plasticization is known to affect the mechanical properties and adhesion, the latter effects were studied for the two types of plasticization in chlorinated polyvinylchloride. Standard commercial chlorinated polyvinylchloride (molecular weight of about 55 000) was used with the low-molecular plasticizers chlorinated biphenyl and dibutylphthalate. Tests were made on samples with concentrations of plasticizers ranging up to 3-4%. Observations on the behavior of the glass point confirm previous experimental work: the glass point declines in proportion to the amount of plasticizer in intrabundle plasticization, but only to a definite percentage in interbundle plasticization. This latter is apparently due to the failure of the plasticizer

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L 51398-65

ACCESSION NR: AP5011257

2
between the supramolecular formations to cause degradation of other structural elements in the system. Maximal adhesion and tensile strength with minimal internal stress were obtained with 0.02% chlorinated biphenyl. It was also observed that the concentrations corresponding to optimal mechanical properties (during interbundle plasticization) also correspond to the greatest diminution in glass point. The best combination of mechanical properties thus corresponds to the greatest mobility of the supramolecular formations. The effect of chlorinated biphenyl as an interbundle plasticizer is related to breaking of the contacts between the supramolecular formations. Orig. art. has: 3 figures.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut lakokrasochnoy promyshlennosti. (State Scientific Research and Planning Institute of the Paint and Varnish Industry). Moscow.

SUBMITTED: 11Jul64

ENCL: 00

SUB CODE: 00, 00

NO REF SOV: 007

OTHER: 001

JD
Card 2/2

L 13491-66 EWT(m)/EWP(j)/T RM

ACC NR: AP6001682

SOURCE CODE: UR/0303/65/000/006/0034/0039

AUTHORS: Maslennikova, N. L.; Sanzharovskiy, A. T.; Makubovich, S. V.

ORG: none

TITLE: Changes of mechanical properties and internal stresses of perchlorovinyl resin coating during the process of atmospheric aging

SOURCE: Lakokrasochnyye materialy i ikh primeneniye, no. 6, 1965, 34-39

TOPIC TAGS: plastic coating, pigment, plasticizer, tensile stress

ABSTRACT: Changes in relative elongation, tenacity, and internal stresses occurring during aging of perchlorovinyl (I) coating which contains various plasticizers and pigments were investigated at the atmospheric station GIPI-4 in Moscow during April-November. It was found that introduction of 0.46 parts (by wt.) of alkyd resin (II) lowers by 2 to 3 times the elastic modulus, tenacity, and internal stress, while increasing rupture elongation. Introduction of 0.3 parts (by wt.) of chlorinated biphenyl (III) results in an even stronger plasticizing effect than addition of II. The combined effect of adding II and III is cumulative. Addition of pigments (TiO_2 , ZnO , gas black) causes an increase in tenacity, in elastic modulus, and in internal stress, but produces a marked decrease in rupture elongation. The general conclusion was reached that spontaneous destruction of polymeric coatings occurs when internal stresses become equal to long-term tenacity. For rigid coatings,

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UDC: 667.613.2:620.193.2

L 13491-66

ACC NR: AP6001682

internal stresses correspond to \sim half of the short-term tenacity, for elastic coatings, to 10--15%. G. I. Kruchinina participated in this work. Orig. art. has: 3 tables, 9 figures, and 1 formula.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 006

Card 2/2

L 3520-66 EWT(m)/EWP(i)/EWP(j)/EWP(t)/EWP(b) JD/RM

AM5013212

BOOK EXPLOITATION

UR/

667.64.621.0(083)

31
30
849

Col'dberg, M. M. (Candidate of Technical Sciences); Vladychina, YE. N. (Engineer);
Yakubovich, S. V. (Candidate of Technical Sciences), eds. 44.57

Handbook on lacquer coating in the machine industry (Spravochnik po lakokrasochnym
pokrytiyam v mashinostroyeni) Moscow, Izd-vo "Mashinostroyeniye", 1964.
475 p. illus., biblio. Errata slip inserted. 9500 copies printed.

TOPIC TAGS: lacquer, corrosion inhibitor, rust inhibitor, specialized coating,
working condition, safety engineering, fire protection

PURPOSE AND COVERAGE: The book is a handbook which contains information on
lacquer and test of lacquers. It also describes the technical characteristics
and designs of plants engaging in basic lacquering and drying processes. The
book is designated for engineering and technical workers of lacquering shops
in machine building industry and for planning organizations.

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L 3520-66

AM5013212

SUB CODE: MT, GO

NO REF SOV: 049

SUBMITTED: 31Oct64

OTHER: 000

PC
Card 3/3

YAKUBOVICH, S.Z., red.

[Cooking sulfite pulp] Varka sul'fitnoi tselliulozy.
(MIRA 18:6)
Moskva, 1964. 14 p.

1. Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut
informatsii i tekhniko-ekonomicheskikh issledovaniy po
lesnoy, tsellyulozno-bumazhnoy, derevoobrabatyvayushchey
promyshlennosti i lesnomu khozyaystvu.

YAKUBOVICH, S.Z.; SHENDAREVA, L.V., tekhn.red.

[Latest developments in the manufacture of viscose pulp]
Novoe v proizvodstve viskoznoi tselliulozy. Moskva, 1959.
23 p. (MIRA 12:11)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam
stroitel'stva.
(Woodpulp) (Viscose)

YAKUBOVICH, S.Z., red.

[Improvement of sulfite cooking] Sovershenstvovanie sul'-
fitnoi svarki. Moskva, 1963. 42 p. (MIRA 17:4)

1. Moscow. TSentral'nyy nauchno-issledovatel'skiy institut
informatsii i tekhniko-ekonomicheskikh issledovaniy po les-
noy, tsellyulozno-bumazhnoy, derevoobrabatyvayushchey pro-
myshlennosti i lesnomu khozyaystvu.

BOBROV, A.I.; SIDOROV, S.K.; YAKUBOVICH, S.Z., red.; SHENDAREVA,
L.V., tekhn. red.; PETRENKO, V.M., tekhn. red.

[Manufacture of cable paper] Proizvodstvo kabel'noi bumagi.
Moskva, TSentr. in-t tekhn. informatsii i ekon. issl. po
lesnoi, bumazhnoi i derevoobrabatывaiushchei promyshl.,
1962. 47 p. (MIRA 16:4)

(Paper)

YAKUBOVICH, S.Z., nauchn. red.; PETRENKO, V.M., tekhn. red.

[Utilization of sawmilling waste for manufacturing
industrial shavings] Ispol'zovanie otkhodov lesopileniya
dlya polucheniya tekhnologicheskoi shchepy. Moskva, 1963.
24 p. (MIRA 16:9)

1. Tsentral'nyy institut tekhnicheskoy informatsii i eko-
nomicheskikh issledovaniy lesnoy, bumazhnoy i derevoobra-
tyvayushchey promyshlennosti.

(Wood waste)

NEMANIKHIN, V.N.; KOMAROVSKIY, L.Ye.; YAKUBOVICH, S.Z., red.

[Improving the technology of the production of tissue paper] Sovershenstvovanie tekhnologii proizvodstva papirosnoi bumagi. Moskva, TSentr. in-t tekhn. informatsii i ekon. issledovani po lesnoi, bumazhnoi i derevoobrabatyvaiushchei promyshl., 1962. 34 p. (MIRA 17:7)

GUBERNSKAYA, L.T., red.; KOSSOY, A.S., red.; FYDLIN, I.Ya., red.; YAKUBOVICH, S.Z., red.

[New developments in woodpulp and paper production; from reports delivered by British and American experts on January 26 1962 in the State Committee of the Council of Ministers of the U.S.S.R. on Research Coordination] Novoe v tselliulozno-bumazhnom proizvodstve; po dokladam angliiskikh i amerikanskikh spetsialistov 26 ianvaria 1962 g. v Gosudarstvennom komitete Sovete Ministrov SSSR po koordinatsii nauchno-issledovatel'skikh rabot. Moskva, 1962. 89 p. (MIRA 17:9)

1. Moscow. TSentral'nyy institut tekhnicheskoy informatsii i ekonomicheskikh issledovaniy po lesnoy, bumazhnoy i derevoobrabatvyayushchey promyshlennosti.

PEREKAL'SKIY, N.P.; MOISEYEV, B.N.; YAKUBOVICH, S.Z., red.

[Norms for lapping woodpulp from the screening and drying sections of wet machines] Normy s"ema tselliulozy s setochnoi i sushil'noi chastei presspatov. Moskva, TSentr. nauchno-issl. in-t informatsii i tekhniko-ekon. issl. po lesnoi, tselliulozno-bumazhnoi, derevoobrabatyvatsheii promyshl. i lesnomu khoziaistvu, 1963. 23 p.

(MIRA 17.8)

YAKUBOVICH, S.Z., red.; VESELOVSKAYA, T.I., red.

[Improving technological processes in the production of sulfate pulp] Uovershenstvovanie tekhnologicheskikh protsessov sul-fatnogo proizvodstva. Moskva, 1963. 39 p.

(MLA 17:7)

1. Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut informatsii i tekhniko-ekonomicheskikh issledovaniy po lesnocy, tsellyulozno-bumazhnoy, derevoobrabatyvayushchey promyshlennosti i lesnomu khozyaystvu.

YAKUBOVICH, S.Z., nauchn. red.

[Improving the quality of newsprint; based on the materials of the interplant school organized by the Central and Perm Province Administrations of the Scientific Technological Society at the Solikamsk Wood-pulp Combine in 1962] Uluchshenie kachestva gazetnoi bumagi; po materialam mezhzavodskoi shkoly, organizovannoi TSentral'nym i Permskim oblastnym pravleniyami NTO v 1962 g. na Solikamskom tselliulozno-bumazhnom kombinat. Moskva, 1963. 42 p. (MIRA 17:5)

1. Moscow. TSentral'nyy institut tekhnicheskoy informatsii i ekonomicheskikh issledovaniy po lesnoy, bumazhnoy i derevoobrabatyvayushchey promyshlennosti.

BOBROV, A.I.; YAKUBOVICH, S.Z., red.

[Production of sulfate pulp using a magnesium base; a survey] Proizvodstvo sul'fitnoi tselliulozy na magnievom osnovanii; obzor. Moskva, TSentr. nauchno-issl. in-t informatsii i tekhniko-okon. issledovaniy po lesnoi, tselliulozno-bumazhnoi, derevoobrabatyvaiushchei promyshl. i lesnomu khoz., 1964. 101 p. (MIRA 18:1)

YAKUBOVICH, T.G.

Effect of zinc and vitamin B₁ on the content of pyruvic acid
in blood during infrared irradiation. Trudy ISGMI 75:202-206
'63. (MIRA 17:4)

YAKUBOVICH, T.G.

Some data on the distribution of zinc trace element in the blood and organs during infrared irradiation. Trudy LSGMI 75:197-201 '63. (MIRA 17:4)

1. Kafedra gigiyeny truda s klinikoy professional'nykh zabolevaniy (zav. kafedroy - prof. Ye.TS. Andreyeva-Galanina) Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta.

YAKUBOVICH, T.G.

Prophylaxis of hypovitaminosis in workers of hot workshops.

Trudy ISOMI 14:77-81 '53.

(MIRA 7:9)

(Deficiency diseases) (Ascorbic acid)(Thiamine)

L 29834-66 ENT(1) SCTB DD

ACC NR: AP6012861

SOURCE CODE: UR/0240/66/000/004/0101/0102

AUTHOR: Yakubovich, T. G.

33
B

ORG: Department of Industrial Hygiene, Occupational Diseases Clinic, Leningrad Medical Institute of Sanitation and Hygiene (Kafedra gigiyeny truda s klinikoy professional'nykh zabolevaniy Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta)

TITLE: Metabolism of vitamins B1 and C under the influence of vibration

SOURCE: Gigiyena i sanitariya, no. 4, 1966, 101-102

TOPIC TAGS: vitamin, biologic metabolism, ~~medical experiment~~, biologic vibration effect, ~~human physiology~~, INDUSTRIAL MEDICINE, BLOOD

ABSTRACT: The author investigated the blood pyruvate, ascorbate, and vitamin B₁ levels in foundry workers subjected to local vibration at frequencies of 20—60 cycles/sec and amplitudes of 0.04—1.42 mm, first during the winter, spring, and fall of 1961 and then during the spring of 1962 after 3-months' treatment with vitamins B₁ and C (1.0 and 100 mg/day, respectively). Whereas the blood vitamin levels were decreased in foundry workers compared to controls, and increased by vitamin administration, the blood pyruvate level was found to increase in direct proportion to the severity of the symptoms of vibration disease. Since administration of vitamins B₁ and C decreased the blood pyruvate level, the high blood

Card 1/2

UDC: 612.015.6.014.45:613.044+613.644-07:612.015.6

L 29834-66

ACC NR: AP6012861

pyruvate in vibration disease is ascribed to a disturbance in liver function resulting from
vitamin C deficiency. Orig. art. has: 3 tables. [08]

SUB CODE: 06 / SUBM DATE: 27Nov64 / ORIG REF: 005 / OTH REF: 001/ ATD PRESS:
5013

Card 2/2

L 38105-66 EWT(d)/EWT(1)/EWP(h)/EWP(1)

ACC NR: AP6022519 (N) SOURCE CODE: UR/0391/66/000/007/0046/0049

AUTHOR: Yakubovich, T. G. (Leningrad)

ORG: Sanitation Hygiene Medical Institute (Sanitarno-gigiyenicheskiy meditsinskiy institut)

TITLE: Effect of general vertical vibration on ascorbic acid and pyruvic acid levels of the blood

SOURCE: Gigiyena truda i professional'nyye zabolevaniya, no. 7, 1966, 46-49

TOPIC TAGS: biologic vibration effect, vitamin, blood chemistry, carbohydrate, biologic metabolism, industrial medicine

ABSTRACT: An earlier study of workers showed that vibration affects the ascorbic acid and pyruvic acid levels of the blood and that vitamin B₁ and vitamin C prophylactic treatment tends to normalize these levels. To elucidate the effects of vibration and vitamin therapy on ascorbic acid and pyruvic acid levels of the blood, 8 series of experiments on 80 white rats and 4 series of experiments on 54 guinea pigs were staged. Following vibration periods of 5 hrs, 10 days, 20 days and 30 days ascorbic acid levels of the blood were determined by Tilman's method and

Cord 1/2

UDC: 612.122+612.129.015.6427.014.457

L 38105-66

ACC NR: AP6022519

pyruvic acid levels of the blood were determined by Friedmann and Haugen's method. In all experiments the vertical vibration frequency was 50 cps and vibration amplitude was 1.5 mm to approximate the vibration parameters most frequently found under industrial conditions. The effects of vitamin B₁ administered intramuscularly in a daily dose of 0.75 mg and vitamin C (daily dose not given) were also investigated. Findings show that in white rats the pyruvic acid level of the blood depends on the vibration period. In guinea pigs the ascorbic acid level is lowered and the pyruvic acid level is increased after vibration. The normalizing effects of vitamin B₁ and vitamin C on ascorbic acid and pyruvic acid levels were confirmed. With daily administration of vitamin C, pyruvic acid elevation was prevented in guinea pigs exposed to vibration for 20 days. Increased pyruvic acid levels of the blood induced by vibration appear to be related to vitamin B₁ and carbohydrate metabolism disorders. On the basis of the demonstrated normalizing effect of vitamin B₁ on pyruvic acid levels, it is concluded that vibration induces a vitamin B₁ deficiency and affects carbohydrate metabolism at the stage of oxidative decarboxylation. Orig. art. has: 3 tables, 1 fig. [06]

SUB CODE: 06/ SUBM DATE: 29Jun64/ ORIG REF: 007/ OTH REF: 001/ ATD PRESS: 5046

Card 2/2 MLP

YAKUBOVICH, T.S.

SOKOLOV, Vasilii Stepanovich, MFTIN, S.D., nauchnyy red.; TOMOCHNIKO, L.K.,
nauchnyy red.; YAKUBOVICH, T.S., nauchnyy red.; SINITSYN, S.N.,
nauchnyy red.; KORIKOVSKIY, I.K., red.; MEDVEDEV, L. Ya., tekhn. red.

[Detection of flaws in materials] Defektoskopiia materialov.
Moskva, Gos.nerg.izd-vo, 1957. 239 p. (MIRA 11:2)
(Metals--Testing)

YAKUBOVICH, V.

Yakubovich, V. - "From Russian geographical antiquity. The first manuscript textbook on geography (Christian Topography, Koz'mo Indikoplov), "Vokrug sveta, 1947, No. 1, p. 58-59

SO: U-3600, 10 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 6, 1949).

YAKUBOVICH, V.

Yakubovich, V. "Students of the Navigation School," [From Russian geographical antiquities], Vokrug sveta, 1949, No. 3, p. 61-62

SO: U-3566, 15 March, 53 (Letopis 'Zhurnal 'nykh Statey, No. 14, 1949).

YAKUBOVICH, V.

Yakubovich, V. - "The first geographic map of Russia", ("Great Map of the Russian Land!"), Vokrug sveta, 1949, No. 4, p. 59-60.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

YAKUBOVICH, V.

19833 YAKUBOVICH, V.

Dva globusa (XVII v.) I z rus. geogr. stariny. vokrug sveta, 1949, No 6, s. 59-60

SO: LETOPIS ZHURNAL STATFY - No., 27, Moskva, 1949

YAKUBOVICH, V.

33930. Zagadki Ozyera Aysbyergov. (Lyednikovoye Ozyero V Gorakh Tyan'-Shanya).
Vokrug Svyeta, 1949, No 10, C. 51-52.

SO: Letopis' Zhurnal'nykh Statey, Vol. 46, Moskva, 1949.

AUTHOR: ~~Yakubovich, V.~~ Head of Aeroflot Agency (Yalta) SOV/84-58-8-42/59

TITLE: More Attention to Advertising (Bol'she vnimaniya reklame)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, Nr 8, p 30 (USSR)

ABSTRACT: In this letter to the editor the author relates how the Yalta city agency advertized the reduction of flight fares to Yalta to the level of railroad tickets during the off-season period, and thereby increased the number of passengers daily from 10 to 60-80. The author maintains that still better results could be attained if the leading personnel of the aviation unit under Prokopov would approve funds for neon signs on the agency premises.

Card 1/1

YAKUBOVICH, V. A.

"The Preoperational and Postoperational Periods With Patients Undergoing Radical Surgery of the Lungs." Cand Med Sci, Central Inst for the Advanced Training of Physicians, 25 Jan 55. (VM, 13 Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

YAKUBOVICH, V. A.

Yakubovich, V. A. On the asymptotic behavior of the solutions of differential equations. Doklady Akad. Nauk SSSR (N.S.) 63, 363-366 (1948). (Russian)

The system (*) $\dot{x}/dt = Ax + f(t, x)$, where x and f are vectors and A is a constant matrix, is considered for the case where A may have multiple characteristic roots and $|f(t, x)| \leq g(t)|x|$. Using the "variations of constants" formula apparently first applied by Dunkel [Proc. Amer. Acad. Arts Sci 38 339-370 (1902)], to such problems the author obtains sufficient conditions of the form $\int_0^\infty g(t)dt < \infty$ for solutions of (*), to be asymptotic as $t \rightarrow \infty$ to solutions of (*) with $f=0$.
N. Levinson

Source: Mathematical Reviews,

Vol. 10 No. 3

YAKUBOVICH, V.A.

Yakubovich, V. A. A certain criterion for reducibility of a system of differential equations. Doklady Akad. Nauk SSSR (N.S.) 66, 577-580 (1949). (Russian)

If $A(t)$ is an n by n matrix of continuous (complex-valued) functions of t ; the system of linear differential equations (*) $dx/dt = A(t)x$ is said to be reducible, if there exists a matrix $P(t)$, $\|P(t)\| \leq \text{constant}$, $\|P(t)\|^{-1} \leq \text{constant}$ ($\|P\| = (\sum_{i,j} |P_{ij}|^2)^{1/2}$, $P = (P_{ij})$), which transforms equation (*) by the substitution $x = P(t)y$ into $dy/dt = Ky$, where K is a constant matrix. It is known, in the case of a periodic system $A(t+w) = A(t)$, that equation (*) is reducible. The author states several generalizations of this result and proves one, namely: the equation (*) is reducible if $A(t+w) = SA(t)S^{-1}$, where S is a matrix equivalent to a unitary matrix. Another criterion for reducibility is obtained by applying a theorem previously proved by the author [same Doklady (N.S.) 63, 363-366 (1948); these Rev. 10, 535]: if $\int_0^{\infty} e^{-\alpha t} \|A(t) - K\| dt$ converges, where m is the dimension of the largest box in the canonical form of the matrix K , then (*) possesses a fundamental matrix $P(t)e^{\alpha t}$, $P(t) \rightarrow E$ (the unit matrix) as $t \rightarrow \infty$, i.e., is reducible as $t \rightarrow \infty$. As a corollary the author obtains the result: if R is a constant matrix, $G(t)$ continuous for $0 \leq t < \infty$, and $G(t) = O(t^{-\alpha})$, $t \rightarrow +\infty$, $\alpha < 1$, then the system $dx/dt = [R + G(t)]x$ possesses a fundamental matrix of the form $e^{Rt}P(t)$, where $P(t) \rightarrow E$, $t \rightarrow +\infty$. As the author states this was proved by A. Wintner for the special case when $\alpha = 0$ and the "cross-modulus" of R satisfies $\sup_{|x|=1} \|XR - RX\| < 1$ [Amer. J. Math. 68, 185-213 (1946); these Rev. 8, 71].

E. A. Coddington (Cambridge, Mass.).

Jan 5/50

Source: Mathematical Reviews, 1950 Vol 11 No. 2

YAKUBOVICH, V.A.

Yakubovich, V. A. On the boundedness of the solutions of the equation $y'' + p(t)y = 0$, $p(t+\omega) = p(t)$. Doklady Akad. Nauk SSSR (N.S.) 74, 901-903 (1950). (Russian)
Considering the vector-matrix differential equation $d(f)/dt = A(t)f$, where $A(t)$ is a continuous periodic matrix whose trace is zero, the author deduces a correspondence between various sets in the space of matrices possessing the above properties and certain intervals of the μ -axis. The sets of matrices are determined by various properties of the solutions such as periodicity, boundedness, and so on. The intervals are determined from certain oscillatory properties of the solutions. These results are used to deduce criteria for boundedness of the solutions of $y'' + p(t)y = 0$, where $p(t)$ is periodic and continuous. These criteria are analogous to those given by Borg [Ark. Mat. Astr. Fys. 31A, no. 1 (1944), there Rev. 8-70]. R. Beiman.

Reviews,

Vol.

12, no. 6

Some 4221

YAKUBOVICH, V. A.

(Yakubovich, V. A. On the asymptotic behavior of the solutions of a system of differential equations. Mat. Sbornik N.S. 28(70), 217-240 (1951). (Russian)

Vector differential equations of the type $dx/dt = Ax + f(t; x)$ are considered, with A a constant matrix, and f subjected to one of the conditions (a) $\|f(t; x)\| \leq g(t)\|x\|$, (b) $\|f(t; x+h) - f(t; x)\| \leq g(t)\|h\|$, where g is a continuous function. Inequalities of simple type for solutions are obtained; these are used to explore the relationship between solutions of the given equation and those of the linear equation obtained by setting $f=0$. Mild generalizations to the case where A is a function of t are given.

J. G. Wendell (New Haven, Conn.).

Source: Mathematical Reviews,

Vol 12 No. 8

Yakubovich, V. A. Criteria of stability for systems of two canonical equations with periodic coefficients. Doklady Akad. Nauk SSSR (N.S.) 78, 221-224 (1951).

Let there be given a system

$$(1) \quad \frac{dq}{dt} = \frac{\partial H}{\partial p}, \quad \frac{dp}{dt} = -\frac{\partial H}{\partial q}$$

where $2H = \alpha(t)q^2 + 2\beta(t)pq + \gamma(t)p^2$ and α, β, γ are continuous and periodic with period ω . In an earlier paper [same Doklady 74, 901-903 (1950); these Rev. 12, 413] it was shown that in the space of the forms H , the set of the forms for which all the solutions of (1) are bounded consists of a countable collection O_n ($n=0, \pm 1, \pm 2, \dots$) of open connected components, the regions of stability. Let $h_n(t)$, $h_n(t)$ be the smallest and largest characteristic root of $\|x_n\|$. We then have: Stability criterion. If

$$\pi\tau < \int_0^\tau h_n(t)dt \leq \int_0^\tau h_{n+1}(t)dt < (n+1)\tau$$

then $H \in O_n$.

Let x denote the vector (p, q) and let

$$\varphi_n = \int_0^\tau [2H/(p^2 + q^2)] dt.$$

Set also $\tan \theta = q/p$. Oscillation theorem: Let x_1, x_2 be solutions of systems (1) for H_1, H_2 and $x_1(0) = x_2(0)$. If $H_1 \in H_n$ and inequality holds for at least one t then the vector $x_1(t)$ is in front of the vector $x_2(t)$, $\theta_1(t) \geq \theta_2(t)$, and $\varphi_1 > \varphi_2$. Stability criterion 2. If $H_1 \in H_n, H_2 \in H_n$ and $H_1, H_2 \in O$, then also $H \in O_n$.

A thorough going oscillation theorem is also given for certain forms H , depending upon a parameter λ . There are either no proofs or else only some indications of proofs. [Additional references: M. G. Krein, same Doklady 73, 445-448 (1950); these Rev. 12, 100; N. V. Adamov, Mat. Sbornik (1) 42, 651-663 (1955). S. Lefschetz.

Source: Mathematical Reviews,

Vol. 13

No. 2

YAKUBOVICH, V. A.

21 Nov 52

USSR/Mathematics - Stability
Characteristics

"Evaluation of the Characteristic Indexes and
Criterion of Stability for the Second-Order
Linear Differential Equation With Periodic
Coefficients," V. A. Yakubovich

"Dok Ak Nauk SSSR" Vol 87, No 3, pp 345-348

Considers subject eq of form $x'' + p(t)x' + q(t)x = 0$
where P, Q are periodic functions of period w
and Lebesgue integrable. Obtains easily veri-
fiable sufficient conditions governing stability

245T79

of eq according to Lyapunov. Thanks Prof V. V.
Nemytskiy for his discussion of results. Sub-
mitted by Acad A. N. Kolmogorov 24 Sep 52.

PA 245T79

245T79

Yakubovich, V. A.
USSR/Mathematics - Differential equations, indices of

FD-948

Card 1/1 Pub 85-2/11

Author : Yakubovich, V. A. (Leningrad)

Title : Evaluations of characteristic indices of a system of linear differential equations with periodic coefficients

Periodical : Prikl. mat. i mekh. 18, 533-546, Sep/Oct 1954

Abstract : A series of rough but effective evaluations of the characteristic indices of a system of linear differential equations of the type $dx/dt = A(t)x$ is attempted. Formulas for evaluating the upper and lower limits of the indices are derived. Ten references.

Institution : --

Submitted : April 23, 1954

YAKUBOVICH, V. A.

YAKUBOVICH, V.A. (Leningrad)

Extension of A.M.Liapunov's method for the determination of the limitedness in the solution of the equations $y'' + p(t)y = 0$, $p(t+\tau) = p(t)$ for the case of the alternating sign function $p(t)$. Prikl.mat. i mekh. 18 no.6: 705-718 N-D '54. (MIRA 8:3)

(Functions, Analytic) (Differential equations, Linear)

YAKUBOVICH, V.A. (Leningrad)

Stability of solutions for second-order linear differential equation
systems of the canonical type having periodical coefficients. Mat.
sbor. 37 no.1:21-68 J1-Ag'55. (MLRA 8:11)
(Differential equations, Linear)

YAKUBOVICH V. A.
 SUBJECT USSR/MATHEMATICS/Differential equations
 AUTHOR JAKUBOVICH W.A.
 TITLE On systems of differential equations of canonical form with
 periodic coefficients.
 PERIODICAL Doklady Akad. Nauk 103, 981-984 (1955)
 reviewed 8/1956

CARD 1/3 PG - 196

Let the system of linear differential equations

$$(1) \quad \frac{dx}{dt} = JH(t)x$$

be given, where x is a vector, J and H are real matrices of order $2k$ and

$$J = \begin{pmatrix} 0 & E \\ -E & 0 \end{pmatrix}$$

$$H(t)^* = H(t)$$

$$H(t + \omega) = H(t).$$

Applying the methods developed during the last years by Krejn, Gel'fand and Lidski, the author extends his former results for the case $2k = 2$ (Doklady Akad. Nauk 78, (1951) No.2) to the case $2k > 2$. The set O of systems (1) which are strongly stable according to Gel'fand, decomposes into a series of open connected subsets $O_n^{(M)}$, $n = 0, \pm 1, \pm 2, \dots$; M attains 2^k values. The author formulates as a criterion of stability: If $H_1(t) \leq H(t) \leq H_2(t)$ and if the systems (1) corresponding to the matrices H_1 and H_2 belong to the same range of stability $O_n^{(M)}$, then also the system corresponding to the matrix $H(t)$ belongs to this $O_n^{(M)}$.

Doklady Akad. Nauk 103, 981-984 (1955)

CARD 2/3

PG - 196

This theorem permits a series of deductions. Let be $H(t) = H_0(t) + H_1(t)$, where H_1 is a diagonal matrix with the elements $h_1(t) \dots h_k(t)$, $h_1(t) \dots h_k(t)$. Furthermore let $h_1^0(t)$ and $h_2^0(t)$ be the minimum and the maximum eigenvalue of $H_0(t)$. The system (1) is strongly stable if for certain numbers $m_{ij}=0, \pm 1, \pm 2, \dots$ the inequations

$$2m_{ij}\pi < \int_0^\omega (h_i + h_j + 2h_1^0) dt \leq \int_0^\omega (h_i + h_j + 2h_2^0) dt < 2(m_{ij}+1)\pi \quad i, j=1, 2, \dots, k$$

are satisfied. If C is a constant matrix and if the corresponding system (1) is strongly stable in a definite range of stability, then the system with the matrix $C + H_0(t)$ belongs to the same range if

$$2m_{ij}\pi < (\alpha_i + \alpha_j)\omega + 2 \int_0^\omega \varphi_1 dt \leq (\alpha_i + \alpha_j)\omega + 2 \int_0^\omega \varphi_2 dt \leq 2(m_{ij}+1)\pi,$$

whereby $\varphi_1(t)$ and $\varphi_2(t)$ are the minimum and the maximum eigenvalue of the matrix $U \cdot H_0(t) \cdot U$, U is real matrix such that $U \cdot C \cdot U$ becomes a diagonal matrix and

$\alpha_1, \dots, \alpha_k$, $\alpha_1, \dots, \alpha_k$ are the elements of the diagonal matrix. If \mathcal{G} is the set of the strongly unstable systems (1), then it decomposes for $k=1$ into a countable number of open connected subsets. \mathcal{G} is connected for $k>1$. It is proved to be suitable to decompose \mathcal{G} into a series of open connected subsets $\mathcal{G}^{(n)}$. The decomposition corresponds to the different positions of the

Doklady Akad. Nauk 103, 981-984 (1955)

CARD 3/3

PG - 196

the multipliers of the monodromy matrix (notations of Krejn, Gel'fand). Here the theorem is valid too: If $H_1(t) \leq H(t) \leq H_2(t)$ and if $H_1, H_2 \in \mathcal{H}_n^{(M)}$, then also $H \in \mathcal{H}_n^{(M)}$. The corresponding proposition for \mathcal{H} is wrong. From this theorem instability criteria are obtained. - If the equations

$$(2) \quad y^{(2k)} + a_1 y^{(2k-2)} + \dots + a_{k-1} y'' + p(t)y = 0 \quad p(t+\omega) = p(t)$$

$$(3) \quad y^{(2k)} + a_1 y^{(2k-2)} + \dots + a_{k-1} y'' + cy = 0$$

are considered, then (2) is strongly stable, if for each c with $\min p(t) \leq c \leq \max p(t)$ (3) is strongly stable. (2) is strongly unstable if for a c subjected to the same conditions (3) belongs to one of the ranges $\mathcal{H}_n^{(M)}$.

Интегральные Математические Решения
Линейные Дифференциальные Уравнения
и Системы Дифференциальных Уравнений
Математический Анализ
Решение дифференциальных уравнений
с помощью метода Эйлера

YAKUBOVICH, V.A.

Boundary-condition dependence of the eigenvalue of self-conjugate
boundary problems for a system of two differential equations [with
summary in English, p.213]. Vest.Len.un. 12 no.1:201-206 '57.
(MLRA 10:5)

(Eigenvalues) (Differential equations)

YAKUBOVICH, V. A.

YAKUBOVICH, V.A.

Over-all stability of an undisturbed motion for equations of indirect
automatic control [with summary in English]. Vest. LGU no. 19:172-176
'57. (MIRA 11:1)

(Automatic control)

40-4-7/24

AUTHOR: YAKUBOVICH, V.A. (Leningrad)

TITLE:

The Extension of Some Results of Lyapunov to Linear Canonical Systems With Periodic Coefficients (Rasprostraneniye nekotorykh resulyatov Lyapunova na lineynyye kanonicheskiye sistemy s periodicheskimi koeffitsiyentami).

PERIODICAL: Prikladnaya Mat.i Mekh., 1957, Vol.21, Nr 4, pp.491-502 (USSR)

ABSTRACT: Let the system $\frac{dx}{dt} = J H(t)x$ (1) be given, where x is a $2k$ -dimensional vector and $J = \begin{pmatrix} 0 & E_k \\ -E_k & 0 \end{pmatrix}$ (E_k is the $k \times k$ - unit matrix). The elements of $H(t)$ are assumed to be piecewise continuous real periodic functions with the period ω . Let each boundary value problem $\frac{dx}{dt} = \lambda J H(t)x$, $x(\omega) = \pm x(0)$ have a real spectrum symmetric with respect to the origin. Let $\det \frac{1}{\omega} \int_0^\omega H(t)dt > 0$.

Let N be the set of all $H(t)$ for which the characteristic

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40-4-7/24

... of Lyapunov to Linear ... coefficients ... $\det [X(\omega) - \lambda E_{2k}] = 0$ of (1) possesses the roots ± 1 . The set of all $H(t) \in N$ is decomposed into four subsets, that depends whether the numbers of the pairs of roots on the positive and on the negative semiaxis are even or odd. It is shown that this classification of the matrices $H(t)$ is decided by the signs of the numbers $\det(X - E_{2k})$ and $\det(X + E_{2k})$. In both cases there are exactly four possibilities (even, even; even, odd; ... and, equally, + + ; + - ; ...). Furthermore the author proves a theorem which follows from a more general result of Kreyn (Priklad.Mat.i Mekh.19,641-680, 1955). Also the other considerations of the author are similar to Kreyn's investigations of the linear canonical systems, however, lie on a much lower level.

Februs r 26, 1957
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SUBMITTED:
AVAILABLE:
CARD 2/2

YAKUBOVICH, V.A.

40-5-14/20

AUTHOR: YAKUBOVICH, V.A. (Leningrad)

TITLE: Remarks on Some Papers Concerning Systems of Linear Differential Equations With Periodic Coefficients (Zamechaniye k nekotorym rabotam po sistemam lineynykh differentsial'nykh uravneniy s periodicheskimi koeffitsiyentami)

PERIODICAL: Prikladnaya Mat. i Mekh., 1957, Vol. 21, Nr 5, pp. 707-713 (USSR)

ABSTRACT: Several authors derived theorems on the boundedness of the solutions of systems of differential equations of second order for n-dimensional vectors in which periodic coefficients occur. The author shows that the most essential results follow, in a very clear way, from some well-known theorems of Lyapunov [Ref. 6]. From Lyapunov's theorems several new theorems can be obtained which are given in detail and proved by the author. They are concerned with the boundedness properties of the solutions of undamped and damped oscillations of systems of differential equations with periodic coefficients in the return term. In the investigations it is shown that the special property of certain frequencies to cause critical states does not only depend on the considered system, but also on the kind of the disturbance. It turns out that also in general for systems of equations there can occur critical frequencies for combina-

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tion frequencies and parts of them. The four theorems given in the paper can be applied for the estimation of the solutions of the initial equations.

The author particularly refers to the papers of Lyapunov [Ref.6] and M.G. Kreyn [Ref.7]. There are no figures, no tables, and 11 references, 6 of which are Slavic.

SUBMITTED: November 9, 1956

AVAILABLE: Library of Congress

Card 2/2

YAKUBOVICH, V. A.

20-1-10/42

AUTHOR:

YAKUBOVICH, V. A.

TITLE:

On a Class of Non-linear Differential Equations (Ob odnom klasse nelineynykh differentsial'nykh uravneniy)

PERIODICAL:

Doklady Akad.Nauk SSSR, 1977, Vol.117, Nr 1, pp.44-46 (USSR)

ABSTRACT:

In a series of papers published in about 1950 A.I. Lur'e considers the non-linear differential equations of an automatic control system with a final control element. The equations have the form

$$(1) \quad \frac{dx}{dt} = Ax + a\varphi(\sigma), \quad \frac{d\sigma}{dt} = (1, x) - \varphi(\sigma),$$

whereby x, b, a are vectors, t is the time, A a matrix, $\varphi = \text{const.}$ and $\varphi(\sigma)$ is the non-linear characteristic of the motor operator: $\varphi(0) = 0, \sigma\varphi(\sigma) > 0$ for $\sigma \neq 0$. By unitary transformations (1) is brought into a canonical form, and then the Lyapunov function of a certain form is formed for the examination of stability. The author proposes a method avoiding the transformation into the canonical form and permitting conclusions concerning the stability of (1) directly from the coefficients of (1). The practical utility of the method for systems with more than 4 degrees of freedom seems to be doubtful because of the enormous expenditure of calculation. Five Soviet references are quoted.

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On a Class of Non-linear Differential Equations

20-1-10/42

. ASSOCIATION: Leningrad State University im. A. A. Zhdanov (Leningradskiy
gosudarstvennyy universitet im. A. A. Zhdanova)
PRESENTED: By V.I. Smirnov, Academician, May 22, 1957
SUBMITTED: May 21, 1957
AVAILABLE: Library of Congress

Card 2/2

AUTHOR: Yakubovich, V.A.

43-58-13-5/13

TITLE: Critical Frequencies of Quasi-Canonical Systems (Kriticheskiye chastoty kvazikanonicheskikh sistem)

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1958, Nr 13(3), pp 35-63 (USSR)

ABSTRACT: Let a stable linear system be submitted to small periodic disturbances. If the frequency ω of these disturbances is such that for arbitrarily small disturbances the system becomes unstable, then ω is denoted as the critical frequency. The author generalizes the original definition of this notion due to Kreyn [Ref 2] (which already occurs in the paper of Cesari [Ref 4]), he gives new partially very simple proofs of well-known results of Kreyn [Ref 2], Gel'fand and Lidskiy [Ref 3] and others and he investigates the critical frequencies of numerous special quasi-canonical systems. A system

$$(1) \quad \frac{dx}{dt} = A(t)x, \quad A(t) \in L(0, 2\pi)$$

is denoted to be quasi-canonical, if there exists a bilinear form $G(x, y) = G(y, x)$, $\text{Det } G \neq 0$, so that for two arbitrary

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Critical Frequencies of Quasi-Canonical Systems

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solutions of (1) it holds:

$$G(x_1(t), x_2(t)) \equiv \text{const.}$$

There are 1 figure and 10 references, 6 of which are Soviet and 4 Italian.

SUBMITTED: February 14, 1957

1. Mathematics

Card 2/2

AUTHOR: Yakubovich, V.A. (Leningrad) 39-44-3-2/3
 TITLE: The Structure of the Group of Symplectic Matrices and the Structure of the Set of Unstable Canonical Systems With Periodic Coefficients (Stroyeniye gruppy simplekticheskikh matrits i struktura mnozhestva neustoychivyykh karonicheskikh sistem s periodicheskimi koeffitsiyentami)
 PERIODICAL: Matematicheskii Sbornik, 1958, Vol 44, Nr 3, pp 313-352(USSR)
 ABSTRACT: M.G. Kreyn [Ref 1 - 6], I.M. Gel'fand [Ref 7] and the author [Ref 9 - 12] already considered the system

$$(1) \quad \frac{dx}{dt} = IH(t)x$$

of $2k$ linear differential equations where $H(t)$ is a symmetric matrix of piecewise continuous real periodic functions,

$I = \begin{pmatrix} 0 & -E_k \\ E_k & 0 \end{pmatrix}$, E_k the unit matrix and x a vector. The rather exhaustive results of Kreyn and Gel'fand mainly refer to the structure of the stability domains. In the present paper the author principally considers the questions of instability. He investigates the set of the unstable systems (1). The difficulty of the investigation consists in the fact that in the

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The Structure of the Group of Symplectic Matrices and the Structure of the Set of Unstable Canonical Systems With Periodic Coefficients 39-44-3-2/3

stable case the monodromy matrix (according to Kreyn) can be brought into diagonal form, while in the unstable case its canonical form can be very complicated. This fact forces the author to introduce a certain topological space and to study the mappings into it. The not very profound but complicated considerations lead the author to several statements concerning the form of the set of matrices $H(t)$ under presupposed eigen values of the fundamental matrix of the solutions (more precisely: under presupposed eigen values of the monodromy matrix). 15 theorems which are partially very long, and a series of lemmata are proved. The author's results allow to answer some questions important for the applications, e.g. of what form are the systems (1) which have a given number of linear independent solutions, the characteristic exponents of which are in certain intervals. There are 4 figures, and 13 Soviet references.

SUBMITTED: June 4, 1956

AVAILABLE: Library of Congress

Card 2/2

1. Matrices - Group Structure
2. Linear differential equations
3. Topology
4. Mapping

SOV/20-121-4-8/ 54

AUTHOR: Yakubovich, V.A.

TITLE: On the Dynamic Stability of Elastic Systems (O dinamicheskoy ustoychivosti uprugikh sistem)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 602-605 (USSR)

ABSTRACT: The author considers the undisturbed system

$$(1) \frac{d^2 y}{dt^2} + P_0 y = 0$$

and the disturbed systems

$$(2) \frac{d^2 y}{dt^2} + P(\theta t) y = 0 \quad \text{and} \quad \frac{d^2 y}{dt^2} + [P + \varepsilon Q(\theta t)] y = 0$$

where P_0, P, Q are real matrices. If the solutions of (1) are stable, then for certain critical values of θ the solutions of (2) can be unstable. In the considered special case the author starts from the general results of Kreyn [Ref 3], Gel'fand and Lidskiy [Ref 4] referring to this and presents two theorems, one of which contains conditions that θ is critical, and the

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On the Dynamic Stability of Elastic Systems

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other contains a statement on the instability range.
There are 4 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova
(Leningrad State University imeni A.A. Zhdanov)

PRESENTED: April 25, 1958, by V.I. Smirnov, Academician

SUBMITTED: April 18, 1958

Card 2/2

SOV/20-21-6-8/45

AUTHOR: Yakubovich, V. A.
 TITLE: On the Boundedness and Stability in the Large of the Solutions of Some Non-Linear Differential Equations (Ob ogranichenosti i ustoychivosti v tselom reshenii nekotorykh nelineynykh differentsial'nykh uravnenii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 6, pp 984-986 (USSR)

ABSTRACT: The author considers the system

$$(1) \frac{dx}{dt} = Ax + a\varphi(\sigma), \quad \frac{d\sigma}{dt} = (b, x) - \zeta\varphi(\sigma), \quad \zeta > 0,$$

appearing in the theory of control, where x is a vector, σ is a scalar, $\varphi(0) = 0$, $\sigma\varphi(\sigma) > 0$ for $\sigma \neq 0$, $\varphi(\sigma)$ continuous, A - matrix, a and b are vectors.

Theorem: Let $|\varphi(\sigma)| \leq \varphi_0$, $-\infty < \sigma < \infty$, let $\zeta + (b, A^{-1}a) > 0$ and

$\operatorname{Re} \lambda_j < 0$, $j=1, \dots, n$, λ_j are eigenvalues of A . Then there exists every solution of (1) on $(0, \infty)$ and it is bounded for $t \rightarrow \infty$.

If here $\|e^{At}\| < \alpha e^{-\beta t}$, $\alpha > 0$, $\beta > 0$, then for $t \geq 0$ holds:

$$\|x(t)\| \leq \alpha e^{-\beta t} \|x(0)\| + \frac{\alpha\varphi_0}{\beta} [1 - e^{-\beta t}] \cdot \|a\|$$

$$|\sigma(t)| \leq |\sigma(0)| + 2 \max_{t \geq 0} |(b, A^{-1}x)|.$$

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On the Boundedness and Stability in the Large of the Solutions of Some Non-Linear Differential Equations SOV/20-121-6-8/45

Let the matrix A have a vanishing eigenvalue, let the others satisfy $\operatorname{Re} \lambda_j < 0$, $j=2, \dots, n$. Determine the magnitudes x_0, y_0, z_0, a_1, b_1 from $a = a_1 + y_0, Ay_0 = 0, (a_1, z_0) = 0, A^*z_0 = 0, Ax_0 = a_1, (x_0, z_0) = 0, b = b_1 + z_0, (b_1, y_0) = 0$. According to the method of Lur'ye (see [Ref 2]) form the equations

$$(2) \quad A^*U + UA = -uu^*, \quad Ua + \xi u + \frac{1}{2} \xi b = 0,$$

where U is a matrix and u is the sought vector.

Theorem: If (2) has a real solution u for the given vector b and for all sufficiently neighboring vectors, and if the integrals

$$\int_0^{\infty} \varphi(\sigma) d\sigma, \quad \int_{-\infty}^0 \varphi(\sigma) d\sigma \text{ diverge, then (1) is stable in the large}$$

(i.e. the trivial solution is stable in the sense of Lyapunov in the small and besides for $t \rightarrow \infty$ for every solution holds

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$x \rightarrow 0, \delta \rightarrow 0$).

From the existence of a certain Lyapunov function two further theorems deduce the asymptotic stability of dynamical systems in the n -dimensional space.

As a special case (1) contains the systems with a non-linearity considered by Aysermann.

There are 5 Soviet references.

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(Scientific Research Institute for Mathematics and Mechanics at
the Leningrad State University imeni A.A.Zhdanov)

PRESENTED: April 25, 1958, by V.I.Smirnov, Academician

SUBMITTED: March 17, 1958

Card 3/3